

# **Energy Expenditure During Extravehicular Activity: Apollo Skylab through STS-135**

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The importance of real-time metabolic rate monitoring during extravehicular activities (EVAs) came into question during the Gemini missions, when the energy expenditure required to conduct an EVA over-tasked the crewmember and exceeded the capabilities of vehicle and space suit life support systems. Energy expenditure was closely evaluated through the Apollo lunar surface EVAs, resulting in modifications to space suit design and EVA operations. After the Apollo lunar surface missions were completed, the United States shifted its focus to long duration human space flight, to study the human response to living and working in a microgravity environment. This paper summarizes the energy expenditure during EVA from Apollo Skylab through STS-135.

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